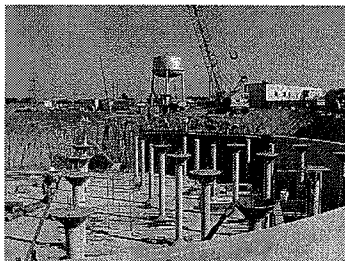
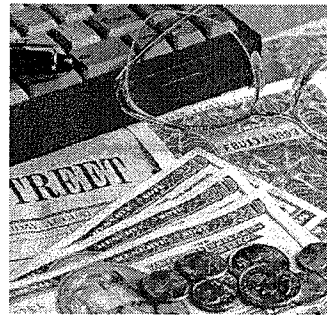
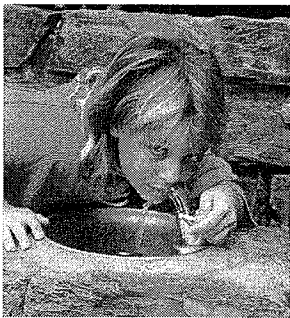




Case Studies of Sustainable Water and Wastewater Pricing



Office of Water (4606M)
EPA 816-R-05-007
December 2005
www.epa.gov/safewater

Printed on Recycled Paper

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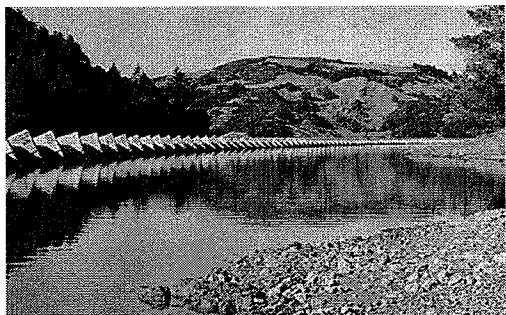
**Rates are regulated by a Public Utility Commission*

Introduction

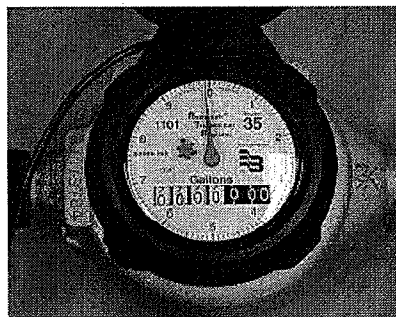
Clean and safe water is critical for both human and ecosystem health. Our nation's livelihood depends, in large part, on the quality of our water—for drinking, swimming, recreation, economic uses, and other benefits of healthy ecosystems. Over the past 20 years communities have spent hundreds of billions of dollars on drinking water treatment and supply and wastewater treatment and disposal. However, the infrastructure that provides us with drinking water and treats our wastewater is aging. Utilities and their local communities must provide the primary sources of funding to meet those needs. The water and wastewater systems profiled in the following case studies offer some valuable perspectives on how utilities and communities can meet these funding needs. While federal and state funding can help water utilities meet future needs, other strategies may be appropriate for addressing the challenges we face in maintaining our nation's water infrastructure.

EPA has developed the Sustainable Infrastructure Initiative to help in addressing these challenges. The initiative is based on **Four Pillars of Sustainable Infrastructure**:

- I Better Management** Better management practices like asset management, environmental management systems, consolidation, and public-private partnerships can offer significant savings for water utilities—both large and small.
- I Full-Cost Pricing** A key consideration in constructing, operating, and maintaining infrastructure is ensuring that there are sufficient revenues in place to support the costs of doing business. Sensible pricing can also have the added benefit of encouraging efficient water use.
- I Efficient Water Use** One way to reduce the need for costly infrastructure is to better manage uses of water. There are many options for enhancing water efficiency including metering, water reuse, water-saving appliances, landscaping, and public education.
- I Watershed Approaches to Protection** In addressing infrastructure needs for the purposes of water supply and water quality, it is important to look more broadly at water resources in a coordinated way. Targeting resources towards highest priorities, permitting on a watershed basis, and water quality trading are all means of ensuring that actions achieve the greatest benefit.



A reservoir and water supply pipeline



A water meter

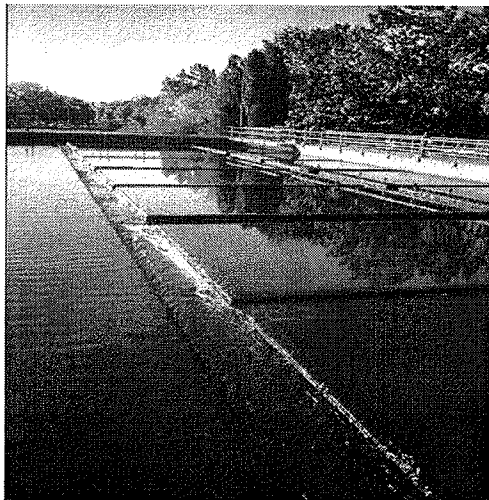
The Role of Sustainable Pricing

The most important source of revenue for water and wastewater systems is their customers. The income customers provide is critical to ensuring that systems are operated properly and efficiently today—and that they will be able to continue providing high-quality service tomorrow. By charging their customers for the actual cost of service, systems guarantee themselves not only a stable source of funds sufficient to cover their costs of operation (including treatment, storage, and distribution costs), but also funds for infrastructure investments.

How much customers are asked to pay for any commodity or service sends a signal to them about the value of the product or service they are purchasing. Fees and other charges that reflect the full cost of water service will help customers to recognize the value of that service and to become more aware of how much water they use and how they use it.

Each of the systems profiled in the case studies that follow has had a different experience in sustainable pricing. Stanly County in North Carolina, for example, is just beginning to make its pricing structure more sustainable. The Marin Municipal Water District in California, on the other hand, has long had a sustainable pricing structure and has been able to combine it with a comprehensive water conservation program.

The experiences of these and the other systems profiled here can give water and wastewater utility staff, state regulators, and providers of technical and financial assistance new perspectives on how to develop and implement sustainable pricing practices.



A sedimentation basin



A water conservation garden

Key Terms

Capital Improvement Plan (CIP)	A budgeting and financial tool that a system can use to establish asset rehabilitation and maintenance priorities and to establish funding for repairs and improvements.
Cash Flow Basis	Measuring and recording the cash receipts and cash payments of an enterprise when they occur. This approach omits accruals, prepayments, deferred payments, and non-cash receipts and non-cash payments.
Certificates of Participation	Tax-exempt government securities used to raise funds to improve and construct buildings or purchase equipment. Investors who purchase Certificates of Participation receive lease payments made by the municipality for the project or equipment.
Cost-of-Service	A system's total cost of providing water to its customers and/or treating its customers' wastewater.
Debt Service	Principal or interest payments on an outstanding debt (e.g., a mortgage or loan).
Decreasing Block Rate	A rate structure under which the price of water per unit (block) decreases as the amount used increases. Blocks are set according to consumption (e.g., up to 2,000 gallons used, 2,000 to 6,000 gallons used, etc.).
Depreciation	An estimate of the reduction in the value of an asset due to wear and tear, obsolescence, or impairment.
Enterprise Fund	A form of accounting that utilizes a separate fund or cost center for a specific purpose. Enterprise funds are generally sustained by revenues generated within a specific entity like a water or wastewater system.
Equitable Rate Structures	Rate structures under which all customer classes (e.g., residential, agricultural) are paying their "fair" share of the full cost of water service.
Flat Rate/Fixed Fee	Rate structure under which all customers pay a set fee (monthly, quarterly, etc.) for water service that is not tied to the amount of water used.
Full Cost Recovery	Recouping the entire cost of water provision through rates, fees, charges, and other revenue derived from water sales.
Increasing Block Rate	Rate structure under which the price of water per unit (block) increases as the amount used increases. Blocks are set according to consumption (e.g., up to 2,000 gallons used, 2,000 to 6,000 gallons used, etc.).
Recycled Water	Treated wastewater used for beneficial purposes such as agricultural and landscape irrigation, toilet flushing, and replenishing a groundwater basin (a process known as groundwater recharge). A common type of recycled water is water that has been reclaimed from municipal wastewater or sewage.
Rate	The charge a system assesses its customers for use of the system's services, usually billed monthly.

Rate Structure

A set of fees and rates that a water system uses to charge its customers for water. The structure can take into account the system's characteristics (e.g., location in a highly industrialized area) and goals (e.g., to generate enough revenue to cover the full cost of water provision and encourage conservation). The structure can also account for customers of different classes (e.g., agricultural or residential), income levels, and water-use habits.

Repayment Insurance

An insurance policy that makes regularly scheduled principal and interest payments on a loan or bond if the borrower is unable to do so and would, without the repayment insurance, default on the debt. (Note that the insurer does not pay off the loan; rather, it makes the regularly scheduled debt service payments. The number of payments the insurer makes may be limited by the terms of the policy.)

Reserve Account

An account used to hold funds set aside to finance future system expenses such as infrastructure rehabilitation or replacement, or to address system emergencies.

Revenue

Funds earned by the system through the sale of water or by other means.

Revenue Bond

A municipal bond issued to finance a project or enterprise in which the issuer pledges to the bondholders the revenues generated by the operation of the projects financed by the bond. Revenue bonds may be issued to fund the construction of bridges, highways, hospitals, and other revenue-generating projects.

Seasonal Rate

A rate that varies depending on the time of the year. Seasonal rates can be used in conjunction with any other rate structure, including flat rates and uniform, decreasing, or increasing block rates.

Single Tariff Rates

A unified rate structure for multiple water systems (or other utilities) that are owned and operated by a single utility but that may or may not be contiguous systems or physically interconnected. Under a system of single-tariff pricing, all customers of the utility pay the same rate for service, even though the individual systems providing service may vary in terms of the number of customers served, operating characteristics, and stand-alone costs.

Surety

A sum of money held as a guarantee for a loan in good faith. It is similar to a deposit on a loan or contract.

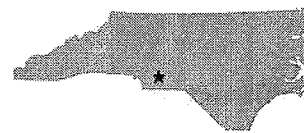
Transfer Payment

Payment made by a government as a gift or aid, not as payment for any good or service nor as an obligation.

Uniform Rate

A rate structure under which customers pay a single charge per unit of water. For example, customers may pay \$5.00 per thousand gallons. The cost per thousand gallons remains constant even if usage changes. A uniform rate may be combined with a fixed fee so customers would pay a fixed monthly fee plus a charge per unit of water purchased.

Stanly County Utilities, North Carolina: Beginning the Transition to Full-Cost Pricing



Background

Stanly County Utilities (SCU) operates two small combined water and wastewater systems and one small water system (Stanly County, Greater Badin Water & Sewer District, and Piney Point Water District) with a combined 9,000-person service population. Although run as an enterprise fund, SCU has long depended on transfer payments from the County's general fund to sustain its operations. SCU realizes this situation is unsustainable—the transfer payments from the County divert resources from other pressing needs and there is no incentive for customers to use water efficiently. SCU is therefore moving to adopt, in the next 5 years, a pricing model that will ensure consistent revenues sufficient to cover its operating costs and fund capital improvements.

To begin its move to full-cost pricing, SCU hired consultants, paid with funds from the North Carolina Rural Economic Development Center, to conduct a rate study and develop a capital improvement plan (CIP). When it initiated the rate study, Stanly County set a number of objectives for any transition to full-cost pricing:

- *Economic Development/Extension of Service.* Water and wastewater service will be used as an incentive for economic development.
- *Consistency with Cost of Service Principles.* Rates will be set to recover the full cost of utility operations, including operation and maintenance (O&M) costs, debt service, capital reinvestment, and indirect costs such as billing, personnel, and vehicle maintenance.
- *Minimal Customer Impacts.* Rates will be adjusted in a manner that avoids large cost increases for customers.
- *Self-Sufficiency.* SCU will no longer depend on transfers from the County to cover its costs.
- *Revenue Stability.* Revenues will be predictable and stable, both seasonally and year to year.
- *Affordability.* Low-income/fixed-income or disadvantaged customers will be protected from unaffordable rates.
- *Conservation/Demand Management.* The pricing structure will encourage more efficient water use.
- *Rate Stability.* Rates will be adjusted in a manner that reflects a planned approach, rather than a reactive approach.
- *Ease of Implementation.* Changes will be easy to communicate to customers and elected officials and will have clear customer service and administrative impacts.
- *Legal/Defensible.* The new rate structure will be consistent with accepted practice and industry standards, local ordinances and state statutes, contractual obligations, etc.

The rate study determined that SCU's water rates needed to be unified and changed to an increasing block rate. SCU's current wastewater rates were found to be sufficient for covering the wastewater systems' operational and capital costs through 2010. SCU completed the first step in modifying its water rate structure in 2005, by reducing the number of rate blocks and creating a single tariff for the three systems it operates. The utility will move from its current decreasing block structure to a flat rate by 2007, and eventually to an increasing block rate.

Besides changing its water rate structure, SCU is moving towards self-sufficiency by reducing the annual transfers it receives from the County's general fund, reducing its reliance on grant funding, contributing to a capital reserve fund, and positioning itself to fully support capital expenditures through reserves, low-interest loans, and revenue bonds by 2010. The result will be a system that no longer diverts valuable County resources to subsidize its water rates, sends its customers appropriate

price signals about the value of their water and wastewater service, and has a sustainable pricing structure.

Cost Allocation

SCU's operating costs include supply, storage, and distribution infrastructure and maintenance. Its costs also include debt service. Water system costs historically have been covered by SCU's operating account, the County's general fund, grants, and low-interest loans. Wastewater system costs are covered by wastewater rate revenue. In its transition to full-cost pricing, SCU will reduce its dependence on grants and transfers from the County's general fund and eventually will fully fund operations from its operating fund. In 2006, SCU will establish and begin funding an operating reserve fund. The utility also plans to establish a capital reserve fund and anticipates beginning to transfer funds to it from the operating reserve fund in 2009. SCU includes depreciation in its accounts, but at this point in its transition to full-cost pricing does not fund the depreciation. As SCU's rates and rate structure are adjusted further in the utility's transition to full-cost pricing, SCU will allocate costs to the appropriate customers and customer classes. SCU's rate model anticipates financing capital projects with a combination of rate revenue and debt. Debt financing will continue to include low-interest loans and will begin to include revenue bonds issued by the utility.

Subsidies/Transfer Payments

SCU currently funds 10 percent of its capital improvement costs through cash or debt; the balance comes from the County's general fund, grants, and federal appropriations, including a large grant from the North Carolina Clean Water Management Trust Fund and an appropriation (under section 219 of the Water Resources Development Act) to the US Army Corps of Engineers.

Rates

The utility currently has a fixed charge for the first 2,000 gallons of water used and a decreasing block rate thereafter. There are separate water rate schedules for residential and commercial users.

Wastewater customers are charged a uniform usage rate based on their water consumption.

Rate Structure: Water: decreasing block rate with a minimum charge. Wastewater: uniform rate.

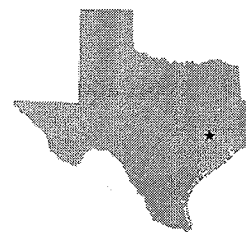
Lifeline Rate/Program: None. The utility directs users who have difficulty paying their water bills to a local crisis assistance center that can help cover expenses such as water bills.

Implementation: SCU reduced the number of rate blocks and created a single tariff in 2004 and 2005. It will change its rate structure from the current decreasing block structure to a flat rate by 2007, and then eventually to an increasing block rate. SCU has several public involvement objectives for its transition to full-cost pricing, including improved communication within and among stakeholder groups, stakeholder education to increase awareness of SCU's obligations and objectives, and coordination with affected groups to find common solutions.

Current Rates

Meter Size/ Customer Class	Fixed Fees/Charges	Usage Fees/Charges	
		Water	Wastewater
Residential	\$16.58/month for first 2,000 gal.	\$7.73/1,000 gal. for 2,001 to 10,000 gal.	\$5.25/1,000 gal.
		\$5.31/1,000 gal. for 10,001 to 20,000 gal.	
		\$2.37/1,000 gal. for over 20,000 gal.	
Commercial	\$18.08/month for first 2,000 gal.	\$10.14/1,000 gal. for 2,001 to 10,000 gal.	\$5.25/1,000 gal.
		\$6.89/1,000 gal. for 10,001 to 20,000 gal.	
		\$2.37/1,000 gal. for over 20,000 gal.	

G&W Water Supply Corporation, Texas: Developing Rates in a Growing Rural System



Background

The G&W Water Supply Corporation (G&W) is a member-owned nonprofit water system in Grimes and Waller Counties in southeast Texas. This growing rural system began with the consolidation of two small private systems in the early 1990s and currently serves about 4,000 people. Aside from occasionally adjusting rates for its only large commercial customer, G&W has had the same rates and rate structure since it began operating. Over the years, G&W has been able to cover the costs of system operation with its revenue; the customer base has grown an average of 10 percent each year and the resulting growth in revenues has matched any increases in costs.

As part of its regional water supplier certification from the Texas Commission on Environmental Quality (TCEQ), G&W has the right to be the retail water provider in its 288-square-mile service area. Past growth in the service area has come from residences and ranches connecting to the system rather than continuing to use private wells or dig new ones. Until very recently, the system has not been affected by the expansion of the Houston suburbs, less than an hour southeast of G&W's service area. A new 480-lot subdivision being built in G&W's service area will have its own water source, treatment, and distribution system; however, as G&W is the regional water supplier, the developer will deed the system to G&W and G&W will soon start to operate the subdivision's water system.

Even though the subdivision will be using its own water, G&W faces the prospect of continued growth in its customer base and increasing demand on its production capacity from other sources. Consequently, G&W recently commissioned an engineering study of its well capacity and infrastructure needs. The study recommended increasing the system's well and storage capacity with three new wells and tanks, adding another stand pipe, and looping the distribution system. With these improvements, G&W should be able to meet the water needs of its customers for up to 20 years.

Once G&W determines the property acquisition costs for the new well and tank sites and identifies financing for the project, it plans to develop a detailed rate model and adjust its rates and rate structure to ensure a sustainable pricing structure. One consideration of any future rate structure will be to ensure that the costs of serving new customers are borne by those new customers (through rates for their customer class, through connection fees, or both). Another equity consideration is that the rates and fees paid by new customers should not subsidize service to existing customers. The arrangement with the new subdivision, where the new customers have covered the costs of developing their own water source, etc., reflects these equity considerations. As G&W moves towards a new phase in its growth, with the costs borne by the appropriate rate payers, it will also begin moving towards an equitably and sustainable pricing structure.

Cost Allocation

G&W contracts with a private company to operate and maintain the system. G&W purchased a Supervisory Control and Data Acquisition (SCADA) system to operate its plants and a computer system to manage its billing. The contractor provides office space. The assets in the new subdivision are paid for by the developer and will be deeded to G&W, which will count the deeded assets as contributed capital. G&W will refund to the developer a portion of the water sales from the subdivision to pay for mains and services. G&W relies on groundwater for all of its raw water, which the system does not treat. Its costs include pumping costs, storage, and maintenance of the distribution system.

The system tracks depreciation in its accounts and maintains several reserve accounts. These reserves include one year of service on its debt (required by the lender, US Department of Agriculture Rural Development), a building fund, and an equipment-replacement fund.

G&W's customers are mostly residential. It has retail business customers and one large commercial customer (a hotel/conference center and campground). The system charges all its residential and retail business customers the same rate, and negotiates a separate rate with its large commercial customer.

Subsidies/Transfer Payments

G&W financed its initial major capital projects (the physical interconnection and upgrades associated with the consolidation of the two original systems) through a combination of US Department of Agriculture Rural Development grants and low-interest loans.

Rates

Each month G&W charges its residential and commercial customers a minimum of \$19.50 for the first 2,000 gallons of water and \$4.00 for each additional 1,000 gallons. The hotel/conference center and campground uses an average of 1 million gallons each month and is charged \$600 for the first 100,000 gallons and \$2.50 for each 1,000 gallons used after the minimum.

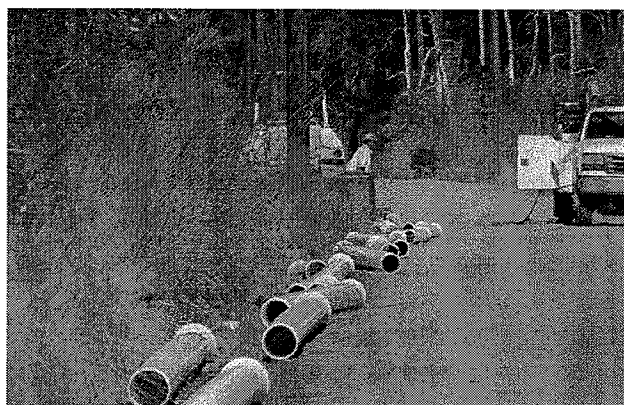
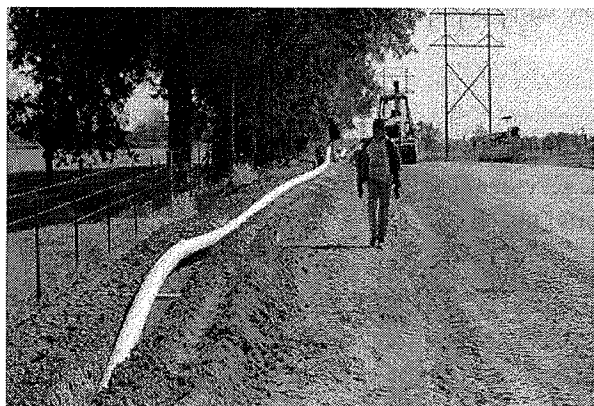
Rate Structure: Minimum monthly charge plus a uniform rate for usage above the 2,000 gallon minimum.

Lifeline Rate/Program: None.

Implementation: G&W holds open board meetings and an annual general meeting that members can attend. G&W intends to consult its members about any rate and rate structure changes through these forums.

Current Rates

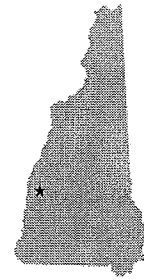
Meter Size/Customer Class	Fixed Fees/Charges	Usage Fees/Charges
Residential and Commercial	\$19.50/month for first 2,000 gal.	\$4.00/1,000 gal. for over 2,000 gal.
Largest Commercial Customer	\$600/month for first 100,000 gal.	\$2.50/1,000 gal. for over 100,000 gal.



G&W laying new service lines and distribution mains

Newport, New Hampshire:

Ensuring a Sustainable and Equitable Rate Structure



Background

The town of Newport in western New Hampshire runs its water system as an enterprise fund. The water system relies primarily on a surface water source in a protected watershed, supplemented by groundwater from a single well. The system serves about 5,000 people and has residential, commercial, and municipal government customers. Its single large industrial user accounts for 20 percent of sales.

In the early 1990s Newport faced the expense of building a new treatment plant for its surface water supply. The system revised its rates in order to cover some of the estimated costs of the new treatment plant and what would be required to cover the system's costs at that point in time. The resulting rate increase covered the system's cost of service including debt service and a portion of the capital project costs.

The system maintained these rates through 2002, when it undertook a rate study to determine the rates necessary to cover its operating costs and the impending capital costs that would not be covered by loans and grants. The rate study projected declining cash and working capital balances due to increasing expenses and repayment of debt and declining revenues due to static rates and decreased usage. The problem year was forecast to be 2004–2005, when cash balances would be depleted and working capital would be below recommended levels. (The projections were similar when capital projects were excluded, but the declines were of lesser magnitude.)

To ensure adequate revenue to maintain its cash and working capital balances, the system chose to increase rates by 10 percent per year from 2004 to 2008. To help offset any rate shock for customers that use nominal amounts of water (and are usually the customers with the most limited resources), the system reduced the cap on the minimum usage charge from 5,000 to 3,000 gallons per billing period.

The rate increases and the rate structure adjustment ensure that the system will continue to cover its cost of service while shifting more of the cost burden to higher volume water users. The resulting pricing structure is more sustainable and more equitable compared to Newport's previous pricing structure.

Cost Allocation

The system's costs are comprised of administration (billing office costs, staff salaries, etc.), treatment (costs incurred from the source to the treatment plant), services (costs incurred from the treatment plant through the distribution system), debt service, and capital costs.

Major capital improvement projects are projected as being funded with capital reserve funds, when possible, along with Drinking Water State Revolving Fund (DWSRF) loans and Community Development Block Grant (CDBG) funds. The projections use historical grant-to-loan percentages. For accounting purposes, grants are recognized either as cash received or as annual loan forgiveness.

The system uses a cash flow basis for rate-setting that includes the costs of planned system improvements. A 10-year planning horizon is used to set rates.